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A NEW CHAETODONT FISH, *HOLACANTHUS LIMBAUGHI*,
FROM THE EASTERN PACIFIC

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DAVID K. CALDWELL
Editor

A NEW CHAETODONT FISH, *HOLACANTHUS LIMBAUGHI*,
FROM THE EASTERN PACIFIC

By WAYNE J. BALDWIN¹

ABSTRACT: A new species of chaetodont fish, *Holacanthus limbaughi*, is described from Clipperton Island. Its relationship to other eastern Pacific members of the genus is discussed.

During the fall of 1956 and summer of 1958 the author was a member of two exploratory expeditions to Clipperton Island (Lat. 10° 18' N, Long. 109° 13' W), a remote coral atoll located approximately 600 miles due west of Costa Rica. These expeditions, organized and directed by personnel from the Scripps Institution of Oceanography, La Jolla, California, allowed us four weeks total elapsed time on the island. Among other duties, the author was responsible for collecting fishes and with the generous assistance of other expedition members 30 collections were made. It is believed that the inshore ichthyofauna is reasonably well collected. These collections are now being studied and will later be reported as a unit, but some new species will be reported earlier.

***Holacanthus limbaughi*, new species**

Figure 1

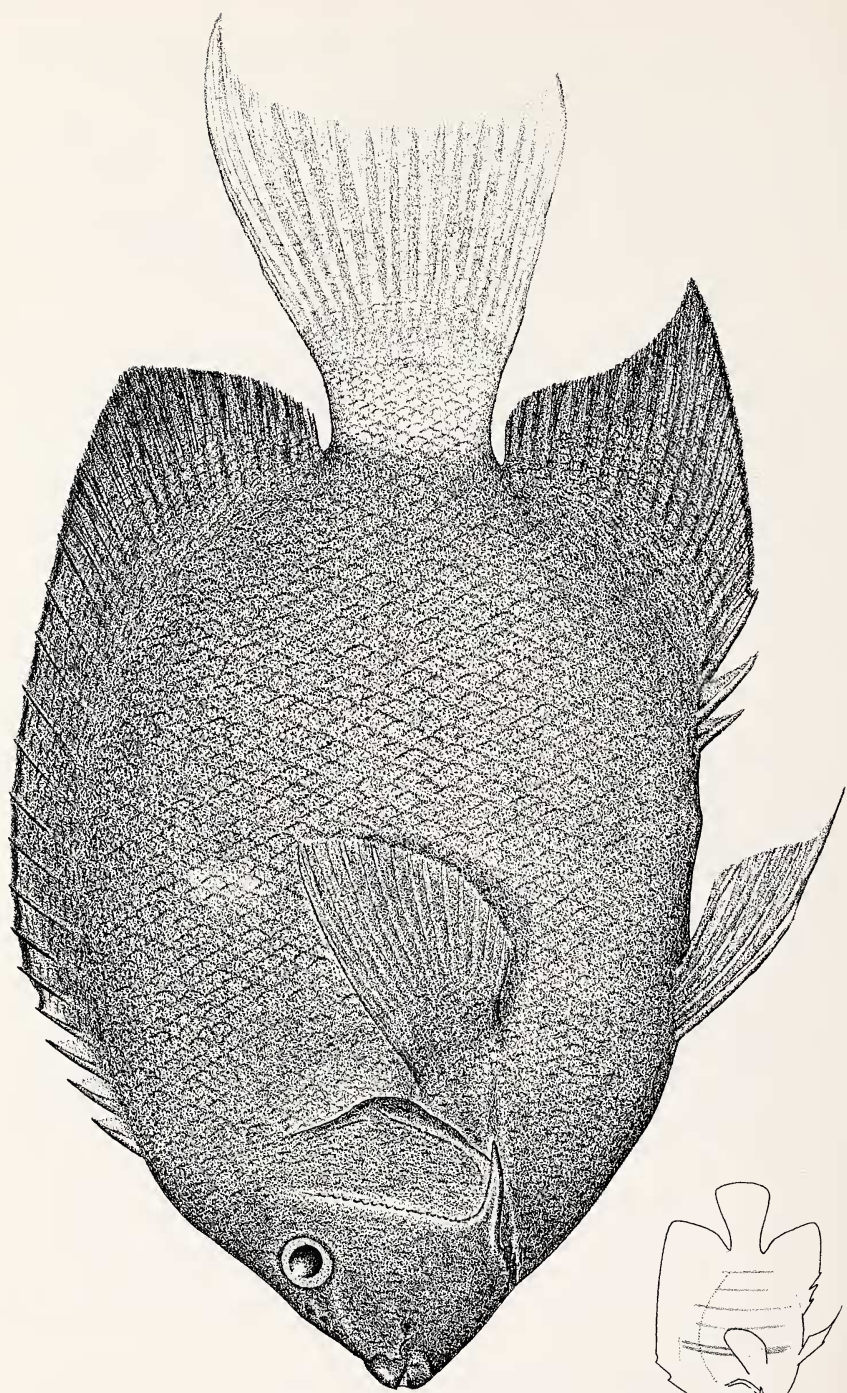
Holotype: U.S. National Museum number 178998, adult male, 171.4 mm. standard length. Collected on the northwest shore of Clipperton Island with explosives by Conrad Limbaugh, Wayne J. Baldwin, and party, 22 to 29 October, 1956.

Paratypes: Clipperton Island; UCLA 56-236, 2, (176.1-214.5 mm.) taken with the holotype, UCLA 58-287, 3, (70.5-96.6 mm.), UCLA 58-289, 1, (198.6 mm.), LACM 3308, 1, (187.2 mm.) taken with the holotype, LACM 3309, 1, (200.0 mm.), LACM 3307, 1, (79.0 mm.).

Of eleven specimens of a new *Holacanthus* collected at Clipperton Island, six paratypes and one 24.0 mm. juvenile were deposited in the fish collection of the University of California, Los Angeles, California (UCLA). The holotype was deposited in the United States National Museum, the remaining three paratypes went to the Los Angeles County Museum, Los Angeles, California (LACM).

H. limbaughi appears to be fairly common close to shore in waters 20 to 30 feet in depth and deeper as noted by several expedition members while diving immediately outside the reef "breaker line." Eight specimens, including the holotype, were collected with explosives in areas a short distance from shore, two specimens were speared, and one juvenile was captured in a hand net while diving.

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Diagnosis: A *Holacanthus* distinguished by the following combination of characters: uniform dark brown color, one light oval spot below spinous dorsal, light brown caudal fin lacking a narrow black margin, caudal fin concave with the upper caudal rays prolonged, rounded soft dorsal, moderately pointed anal.

Counts and Measurements: The values for the holotype are given first, the range of values for the nine paratypes are shown in parentheses. Measurements are expressed in thousandths of standard length and all proportions are straight line measurements made with needle-point dividers. All counts and measurements follow Hubbs and Lagler (1958) except for those explained below.

Body depth—depth of body at origin of anal fin; *interorbital width*—width of bony interorbital over center of eyes; *length of orbit*—horizontal distance through center of eye; *upper and lower caudal lobe*—distance from base of upper and lower caudal rays to their extremities; *longitudinal scale rows*—number of diagonal scale rows from upper end of operculum to center base of caudal fin; *scales above the lateral line*—number of scales between lateral line and base of sixth dorsal spine; *gill rakers*—total number of gill rakers on lower limb of first gill arch.

Body depth 583 (524-601); head length 272 (262-321); snout length 115 (103-130); interorbital width 096 (096-109); length of orbit 064 (058-121); preopercular spine length 085 (056-109); length maxillary 071 (069-092); depth caudal peduncle 149 (143-154); snout to base of dorsal 329 (324-390); snout to base of anal 624 (620-658); snout to base of pectoral 277 (254-321); snout to base of pelvics 379 (350-404); length first dorsal spine 064 (057-095); length seventh dorsal spine 090 (086-135); length of 14th. dorsal spine 125 (120-180); length first anal spine 067 (054-119); length second anal spine 087 (083-163); length third anal spine 105 (098-177); length dorsal fin 793 (737-805); length anal fin 514 (422-492); length pectoral fin 275 (261-305); length pelvic fin 293 (213-300); length upper caudal lobe 353 (250-340); length lower caudal lobe 280 (220-278); length middle caudal rays 250 (234-269).

Dorsal XIV, 17 (XIV, 17-18); anal III, 18 (III, 17-18); pectoral 18 (17-18); longitudinal scale rows 47 (45-48); scales above lateral line 7 (6-9); scales below lateral line 25 (26-27); gill rakers 12 (11-12); dorsal ray number at termination point of lateral line 11 (9-13).

Description: Body oblong, compressed, its greatest depth midway between snout and base of caudal, 1.8 (1.7-1.9) in standard length. Head profile unevenly convex with a slight indentation over eyes, head 3.7 (3.2-3.8) in stand-

Figure 1. *Holacanthus limbaughi*, Holotype, USNM 178998. 171.4 mm. standard length, from Clipperton Island.

Figure 2. Diagrammatic representation of barred pattern of juvenile *Holacanthus limbaughi*, UCLA 58-370, 24.0 mm. standard length, from Clipperton Island. See text for full color description.

ard length. Bony interorbital evenly convex, its width slightly less than length of snout, 3.0 in head. A distinct shallow preorbital groove anterior to eye, running forward immediately below nostrils. Nostrils nearly equal in size, posterior opening occasionally the larger. Preorbital bone with two to four prominent spines on free margin. Free margin of preoperculum moderately dentate, 21 (20 to 30) serrae above preopercular spine, usually with one or two small spines below. Interopercal with one to three prominent spines on ventral margin. Operculum entire or with a few weak serrae on lower edge. Teeth long, narrow, pointed, in brushlike series. Caudal peduncle 1.8 (1.7-2.1) in head. Margin of spinous dorsal continuous with margin of soft dorsal, the spines gradually increasing in length posteriorly, last dorsal spine 2.2 (2.0-2.5) in head. Soft dorsal not notably produced, usually rounded. Anal spines strong with the third longest, slightly less than last dorsal spine in length. Soft anal pointed to rounded posteriorly, moderately produced in larger individuals. Four specimens in the 70 to 90 mm. range have the dorsal and anal evenly rounded, the anal not produced. Caudal convex in small individuals becoming notably concave to slightly truncate in large specimens and with the upper caudal lobe produced. Pectorals equal to length of head. Pelvics elongate, reaching to past anus and occasionally to base of anal. Dorsal, anal, and caudal fins wholly covered with small irregular, ctenoid scales except for membranes between first three dorsal spines and between anal spines. Pectoral and pelvic fins scaled only on the rays. Smaller specimens have only the base of pectorals scaled. Scales on body rough, ctenoid, moderately large with numerous small accessory scales. Scales on head small, closely packed. Lateral line strongly arched, terminating below posterior half of soft dorsal, may be quite indistinct in large specimens.

Coloration in Alcohol: Body uniform dark brown. One light, oval spot on side of body equal to diameter of eye located one snout length below seventh or eighth dorsal spine, may be indistinct or completely lacking. Dorsal and anal dark brown as rest of body except for membranes between anterior dorsal spines and between anal spines being somewhat lighter. Both dorsal and anal with a narrow black margin at tips of rays becoming broader posteriorly. Caudal dusky to light brown, becoming darker with increase in size. Caudal fin color gradually grades into the darker body on the caudal peduncle without a sharp demarcation. Pectoral and pelvic fins about same color as body, pectorals lighter in smaller specimens.

Freshly Preserved Coloration: Body dark brown but with a purplish cast in sunlight. The oval spot below the spinous dorsal more pronounced, may appear light gray. Membranes between anterior dorsal spines and anal spines brownish orange, gradually grading into the darker brown posteriorly. The narrow margin at edge of dorsal and anal bright blue, wider and more pronounced posteriorly. The caudal fin is light gray to light brown with the tips of the rays slightly darker.

Comparison: Members of the genus *Holancanthus* as defined by Fraser-

Brunner (1933) have large scales (less than 50 in longitudinal series), incomplete lateral line, hind edge of the preopercular bone covered with skin, large interopercal, and about nine rows of scales on the cheek. Three species of *Holacanthus* have been described since the revision of the subfamily Pomacanthinae by Fraser-Brunner (1933). These include *H. africanus* Cadenat 1950, *H. xanthotis* Fraser-Brunner 1950, and *H. armitagei* (Smith) 1955. No new species that correspond to *H. limbaughi* have come to light since the revision by Fraser-Brunner (1933).

Two previously described members of the genus are known from the eastern Pacific Ocean, *H. passer* Valenciennes and *H. clarionensis* Gilbert. Counts and proportions of *H. limbaughi* are in close proximity to those of *H. passer* and *H. clarionensis* but reliable diagnostic characters remain in the degree of prolongation of the dorsal and anal fins, caudal fin shape, and coloration. The dorsal and anal fins of *H. limbaughi* and *H. clarionensis* are narrowly rounded with at most a sharply pointed anal in the former species, while *H. passer* has the dorsal and anal notably prolonged often reaching to the tip of the caudal fin. The caudal fin of *H. limbaughi* is notably concave with the upper lobe distinctly elongate as opposed to the slightly truncate caudal of *H. clarionensis* and the evenly convex caudal fin of *H. passer*, both lacking the prolongation of the upper caudal lobe.

Unlike the majority of species within the family Chaetodontidae, *H. limbaughi* is quite drab in color, being overall dark brown except for the lighter caudal fin and light oval spot below the spinous dorsal. In life *H. clarionensis* is bright orange with the posterior half of the body olive brown, bright orange caudal and the pectoral and pelvic fins yellow. *H. passer* is overall dark purple with a white bar across mid-body below the spinous dorsal, caudal, pectoral, and pelvic fins yellow. The light caudal fin of *H. limbaughi* gradually grades into the dark body of the caudal peduncle without a sharp demarcation and without a narrow black margin at its tip as in *H. passer* and *H. clarionensis*.

Remarks: One 24.0 mm. juvenile, UCLA 58-370, differs from the holotype by its shorter head, larger eye, broader interorbital, evenly convex caudal fin, and with the dorsal, anal, pectoral, and pelvic fins being somewhat longer. It is similar in body color but with the dorsal, anal, and pelvic fins somewhat darker. There are seven narrow vertical crossbars on head and body (Fig. 2). Two bars on the head run vertically past the anterior and posterior margin of eye with the anterior bar on each side of the head joining over the eyes. The five remaining bars on the body are evenly spaced beginning below the seventh dorsal spine and ending at the termination point of lateral line below the soft dorsal. The bar located below the seventh dorsal spine is widest with its central portion light gray and corresponds in position to the light oval spot below the spinous dorsal of the holotype. This barred pattern, as shown by Fraser-Brunner (1933), is quite similar to the barred phase of both *H. passer* and *H. clarionensis* in specimens of a comparable size.

Derivation of name: This species is named for the late Conrad Limbaugh

who was instrumental in collecting the specimens and was in charge of the Clipperton Island shore parties.

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